What is claimed is:

1. A process for isolating a target cell, cellular organelle or virus from a sample, which process comprises:

a) contacting a sample containing or suspected of containing a target cell, cellular organelle or virus with a magnetic microbead, said magnetic microbead not comprising a moiety that binds to said target cell, cellular organelle or virus with high specificity;

b) allowing said target cell, cellular organelle or virus, if present in said sample, to bind to said magnetic microbead nonspecifically or with low specificity to form a conjugate between said target cell, cellular organelle or virus and said magnetic microbead; and

c) separating said conjugate from other undesirable constituents via a magnetic force to isolate said target cell, cellular organelle or virus from said sample.

2. The process of claim 1, wherein the target cell is selected from the group consisting of an animal cell, a plant cell, a fungus cell, a bacterium cell, a recombinant cell and a cultured cell.

3. The process of claim 1, wherein the target cellular organelle is selected from the group consisting of a nuclei, a mitochondrion, a chloroplast, a ribosome, an ER, a Golgi apparatus, a lysosome, a proteasome, a secretory vesicle, a vacuole and a microsome.

4. The process of claim 1, wherein the target virus is an eucaryotic cell virus or a bacteriophage.

5. The process of claim 1, wherein the magnetic microbead comprises a magnetizable substance selected from the group consisting of a paramagnetic substance, a ferromagnetic substance and a ferrimagentic substance.

6. The process of claim 5, wherein the magnetizable substance comprises a metal composition.

7. The process of claim 6, wherein the metal composition is a transition metal composition or an alloy thereof.

8. The process of claim 7, wherein the transition metal is selected from the group consisting of iron, nickel, copper, cobalt, manganese, tantalum, zirconium and cobalt-tantalum-zirconium (CoTaZr) alloy.

9. The process of claim 6, wherein the metal composition is Fe_3O_4.

10. The process of claim 1, wherein the magnetic microbead has a diameter ranging from about 5 to about 50,000 nanometers.

11. The process of claim 1, wherein the magnetic microbead is untreated or modified with an organic molecule.

12. The process of claim 1, wherein the magnetic microbead is modified to comprise a hydroxyl, a carboxyl or an epoxy group.

13. The process of claim 1, which further comprises washing the separated conjugate to remove the undesirable constituents.

14. The process of claim 1, which further comprises recovering the target cell, cellular organelle or virus from the separated conjugate.

15. The process of claim 14, wherein the target cell, cellular organelle or virus are released from the separated conjugate with a suitable buffer solution into the buffer and the magnetic microbead is removed from the solution via a magnetic force.

16. The process of claim 1, wherein the sample is a clinical sample.

17. The process of claim 1, wherein the sample is selected from the group consisting of serum, plasma, whole blood, sputum, cerebral spinal fluid, amniotic fluid, urine, gastrointestinal contents, hair, saliva, sweat, gum scrapings, marrow, tissue and cell culture.

18. The process of claim 1, which further comprises recovering a biological material from the isolated target cell, cellular organelle or virus.

19. The process of claim 18, wherein the biological material is selected from the group consisting of an amino acid, a peptide, a protein, a nucleoside, a nucleotide, an oligonucleotide, a nucleic acid, a vitamin, a monosaccharide, an oligosaccharide, a carbohydrate, a lipid and a complex thereof.

20. The process of claim 19, which further comprises amplifying the recovered oligonucleotide or nucleic acid.

21. The process of claim 1, which is automated.

22. The process of claim 1, which is completed within a time ranging from about 1 minute to about 20 minutes.

23. The process of claim 1, which is conducted in an eppendorf tube.

24. The process of claim 1, which is conducted in the absence of a precipitation procedure.

25. The process of claim 1, which is conducted in the absence of a poisonous agent.

26. The process of claim 1, which is conducted at an ambient temperature ranging from about 0°C to about 35°C.

27. The process of claim 1, which is used to isolate a leukocyte from whole blood, marrow or lympha.

28. The process of claim 27, wherein the whole blood, marrow or lympha is fresh or low-temperature conserved whole blood, marrow or lympha.

29. The process of claim 27, wherein the leukocyte is contacted with the magnetic microbead in a suitable chemical environment having the following characteristic(s):

a) a pH ranging from about 3 to about 7; and/or

b) a suitable concentration of an anticoagulant.

30. The process of claim 29, wherein the anticoagulant is selected from the group consisting of acid citrate dextrose (ACD), sodium citrate and sodium heparin.

31. The process of claim 27, which further comprises washing the separated leukocyte-magnetic-microbead conjugate with a washing buffer to remove the undesirable constituents.

32. The process of claim 31, wherein the washing buffer is physiological salt water having a pH at about 6.5 or a phosphate buffer (PBS) having a pH at about 6.5.

33. The process of claim 27, wherein the leukocyte is released from the separated leukocyte-magnetic-microbead conjugate with a suitable separation buffer solution into the buffer and the magnetic microbead is removed from the solution via a magnetic force.

34. The process of claim 1, which is used to isolate a target cell, cellular organelle or virus from saliva, urine and tissue culture.

35. The process of claim 34, wherein the target cell is an epithelia cast-off cell or a bacteria cell.

36. The process of claim 34, wherein the saliva, urine and tissue culture is fresh or low-temperature conserved saliva, urine and tissue culture.

37. The process of claim 34, wherein the target cell, cellular organelle or virus is contacted with the magnetic microbead in a suitable chemical environment having a pH ranging from about 3 to about 7.

38. The process of claim 34, which further comprises washing the separated conjugate between the target cell, cellular organelle or virus and the magnetic microbead with a washing buffer to remove the undesirable constituents.

39. The process of claim 39, wherein the washing buffer is physiological salt water having a pH at about 6.5 or a phosphate buffer (PBS) having a pH at about 6.5.

40. The process of claim 34, wherein the target cell, cellular organelle or virus is released from the separated conjugate between the target cell, cellular organelle or virus and the magnetic microbead with a suitable separation buffer solution into the buffer and the magnetic microbead is removed from the solution via a magnetic force.

41. The process of claim 41, wherein the separation buffer is a Tris-EDTA buffer having a pH ranging from about 6.5 to about 8 and a detergent at a concentration about less than 1% (w/w).

42. A kit for isolating a target cell, cellular organelle or virus from a sample, which kit comprises in a same or different container(s):

a) a magnetic microbead for contacting a sample containing or suspected of containing a target cell, cellular organelle or virus, said magnetic microbead not comprising a moiety that binds to said target cell, cellular organelle or virus with high specificity;

b) means for allowing said target cell, cellular organelle or virus, if present in said sample, to bind to said magnetic microbead nonspecifically or with low specificity to form a conjugate between said target cell, cellular organelle or virus and said magnetic microbead; and

c) means for separating said conjugate from other undesirable constituents via a magnetic force to isolate said target cell, cellular organelle or virus from said sample.

43. The kit of claim 43, which further comprises an instruction for using the kit for isolating a target cell, cellular organelle or virus from a sample.

44. A process for isolating a virus or bacteriophage from a sample, which process comprises:

a) removing cells from a sample containing or suspected of containing a target virus or bacteriophage;

b) contacting said cell-free sample with a magnetic microbead, said magnetic microbead not comprising a moiety that binds to said target virus or bacteriophage with high specificity;

c) allowing said target virus or bacteriophage, if present in said sample, to bind to said magnetic microbead nonspecifically or with low specificity to form a conjugate between said target virus or bacteriophage and said magnetic microbead; and

c) separating said conjugate from other undesirable constituents via a magnetic force to isolate said target virus or bacteriophage from said sample.

45. The process of claim 45, wherein the sample is saliva, urine or serum.

46. The process of claim 46, wherein the saliva, urine or serum is fresh or low-temperature conserved saliva, urine or serum.

47. The process of claim 45, wherein the virus or bacteriophage is contacted with the magnetic microbead in the presence of:

a) a sufficient concentration of a highly hydratable compound at a concentration ranging from about 10% (v/v) to about 100% (v/v); and/or

b) and/or b) a salt at a concentration ranging from about 2.5 M to about 5.0 M.

48. The process of claim 48, wherein the high-hydrability organic compound is selected from the group consisting of ethanol, acetone and polyethylene glycol.

49. The process of claim 48, wherein the salt is sodium chloride.

50. The process of claim 45, wherein the cells are epithelia cast-off cells or bacteria cells.

51. The process of claim 45, which further comprises washing the separated conjugate between the target virus or bacteriophage and the magnetic microbead with a washing buffer to remove the undesirable constituents.

52. The process of claim 52, wherein the washing buffer is physiological salt water having a pH at about 6.5 or a phosphate buffer (PBS) having a pH at about 6.5.

53. The process of claim 45, wherein the target virus or bacteriophage is released from the separated conjugate between the target virus or bacteriophage and the magnetic microbead with a suitable separation buffer solution into the buffer and the magnetic microbead is removed from the solution via a magnetic force.

54. The process of claim 45, wherein the cells are removed from the sample by centrifugation.

55. A kit for isolating a virus or bacteriophage from a sample, which kit comprises in a same or different container(s):

a) means for removing cells from a sample containing or suspected of containing a target virus or bacteriophage;

b) a magnetic microbead for contacting said cell-free sample, said magnetic microbead not comprising a moiety that binds to said target cell, cellular organelle or virus with high specificity;

c) means for allowing said target virus or bacteriophage, if present in said cell-free sample, to bind to said magnetic microbead nonspecifically or with low specificity to form a conjugate between said target virus or bacteriophage and said magnetic microbead; and

d) means for separating said conjugate from other undesirable constituents via a magnetic force to isolate said target virus or bacteriophage from said sample.